

TREK

COMMAND TRAINER

USER GUIDE



November 2012

Approved for Public Release; Distribution is Unlimited.

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1 What You Need To Know Before You Read This Document

Before reading this document you should be familiar with the material in the TReK Getting Started User Guide (TREK-USER-001) and the TReK Command Tutorial (TREK-USER-020). If you have not read these documents, you may have difficulty with some of the terminology and concepts presented in this document.

It is also recommended that you work through the Command Applications Tutorial (TREK-USER-021) before reading this document. The Command Applications Tutorial provides a step-by-step guide to the main features in the Command Processing and Command Trainer applications. In contrast, this document provides details about each menu, dialog box, and message.

We assume you are an experienced Windows user. Information about how to use a mouse or how to use Windows is not addressed in this user guide. Please see your Windows documentation for help with Windows.

2 Technical Support

If you are having trouble installing the TReK software or using any of the TReK software applications, please try the following suggestions:

Read the appropriate material in the manual and/or on-line help.

Ensure that you are correctly following all instructions.

Checkout the TReK Web site at <http://trek.msfc.nasa.gov/> for Frequently Asked Questions.

If you are still unable to resolve your difficulty, please contact us for technical assistance:

TReK Help Desk E-Mail, Phone & Fax:

E-Mail:	trek.help@nasa.gov
Telephone:	256-544-3521 (8:00 a.m. - 4:30 p.m. Central Time)
Fax:	256-544-9353

TReK Help Desk hours are 8:00 a.m. – 4:30 p.m. Central Time Monday through Friday. If you call the TReK Help Desk and you get a recording please leave a message and someone will return your call. E-mail is the preferred contact method for help. The e-mail message is automatically forwarded to the TReK developers and helps cut the response time.

3 Introduction

The TReK Command Trainer application is a training tool. It can be used to “simulate” (and we use the word simulate here very loosely) a POIC command session when you cannot connect to the real POIC. This allows you to send commands and receive responses from your own user-developed program without a real POIC command session.

4 Command Trainer Main Window

The Command Trainer main window consists of two main areas as shown in Figure 1. The top part of the main window contains the list of trainers identified by your TReK system. When you start the Command Trainer application the list will be empty. This is because you have not yet added any trainers to the list. The bottom part of the window is a message area that is used to display important status and error information messages about the command trainer activities in progress.

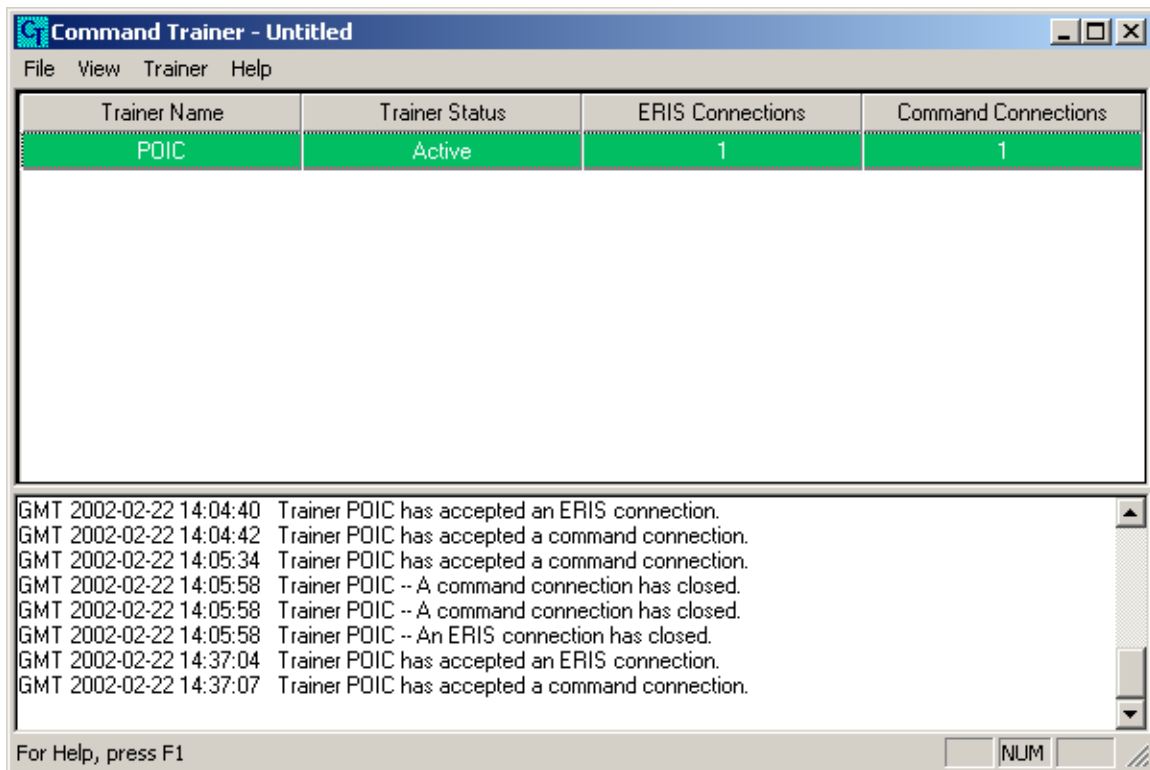


Figure 1 Command Trainer Main Window

There are four pieces of information that are displayed for each trainer in the trainer list. They are Trainer Name, Trainer Status, ERIS Connections and Command Connections. The Trainer Name identifies the trainer. The Trainer Status column identifies the status of the trainer. The ERIS and Command Connections show how many ERIS and Command Connections are active.

In Figure 1 the trainer in the list is a POIC trainer. This trainer has been activated, meaning that the TReK system is ready to provide command trainer support.

If you are running the Command Trainer application or viewing this document from within Microsoft Word then you have probably noticed that the trainer row has a color associated with it. The color provides information about the trainer. For example, when using the default colors, if the trainer row is black, this indicates that the trainer has not been activated. If the trainer row is purple, this indicates that the trainer is initializing. If the trainer row is green, this indicates that trainer is ready to provide support. The colors are helpful in providing immediate information about the general configuration and status of each trainer in the list.

5 Command Trainer Menus

The Command Trainer application contains four main menus: File, View, Trainer, and Help. Each of these menus is described in more detail below.

5.1 File Menu

The File menu is used to create, open, and save command trainer configurations and to exit the Command Trainer application. A Command Trainer configuration is comprised of the trainers in the trainer list along with all the information associated with each trainer. This includes the color preferences you set in the Set Color Preferences dialog. When you save a configuration, the Command Trainer application will default to the <base_path>\configuration_files\command trainer directory.

If the operating system is installed in the default directory on the C drive then:

<base_path> = C:\Documents and Settings\<username>\Application Data\TReK

You can save your configuration files anywhere you like, but this default directory provides an easy way for you to keep up with your files.

Each of the items on the File menu is described below.

New

New provides a way to start a new configuration. When you start a new configuration any trainers in the list are deleted and all activities associated with those trainers are stopped. If there are unsaved trainers in the trainer list when New is selected, you will be given the option of saving the configuration before all the packets are deleted from the trainer list. The New menu item will be insensitive when there are trainers in the trainer list which are initializing. As soon as the trainers(s) finish initializing the menu item will be available.

Open

Open provides a way to open a previously saved configuration. The Open menu item will be insensitive when there are trainers in the trainer list which are initializing. As soon as the trainer(s) finish initializing the menu item will be available.

Save

Save provides a way to save the current configuration. The Save menu item will be insensitive when there are trainers in the trainer list which are initializing. As soon as the trainer(s) finish initializing the menu item will be available.

Save As

Save As provides a way to save the current configuration with another name. The Save As menu item will be insensitive when there are trainers in the trainer list which are initializing. As soon as the trainer(s) finish initializing the menu item will be available.

Exit

Exit provides a way to exit the Command Trainer application. The Exit menu item will be insensitive when there are trainers in the trainer list which are initializing. As soon as the trainer(s) finish initializing the menu item will be available.

5.2 View Menu

The View menu is used to change attributes associated with the Command Trainer main window. There are three items on the View menu. Each is described below:

Status Bar

The Status Bar is located at the very bottom of the Command Trainer main window. The status bar is used to display messages and useful information to you without interrupting your work. The status bar has "panes," which include "indicators" and a "message line." The indicators provide the status of items such as SCROLL LOCK. The message line on the status bar can display information about program status or about a toolbar button or menu item that you are pointing to with the mouse. If you select the Status Bar item on the View menu, this will toggle the Status Bar on and off.

Set Color Preferences

The Set Color Preferences option brings up the Set Color Preferences dialog. This dialog can be used to turn off, turn on, or change the colors used in the Command Trainer main window.

Clear Message Area

As mentioned in section 4, the message area is located at the bottom of the Command Trainer main window. This is where important status and error messages will be displayed while you are working with the application. If you select the Clear Message Area item on the View menu, this will clear all the messages in the Message Area. Once they have been cleared, you cannot get them back.

5.3 Trainer Menu

The Trainer menu is the most frequently used menu in the Command Trainer application. It is used to add trainers to the trainer list in the main window, and to control all the activities associated with each trainer. Each of the items on the Trainer menu are described below.

Add POIC Trainer

Used to add a POIC trainer session on your TReK System. When you select Add POIC Trainer, a dialog box will be presented so that you can fill in the information your TReK system needs in order to know how to identify the trainer.

Activate Trainer

Used to tell the Command Trainer to activate the trainer for commanding support. The Activate Trainer option is only available when you have a trainer selected that has never been activated (i.e., Training Status is Inactive.)

Delete Trainer

Used to tell your TReK system to stop your trainer session. When you select a trainer in the trainer list, and then select the Delete Trainer option, the trainer will be removed from the list and your TReK system will stop the trainer session. The Delete Trainer option is only available when you have a trainer selected.

Show Trainer Properties

Used to see a complete list of properties about a particular trainer. This includes information such as the Trainer Name, Trainer Connection Information, Configuration information, Command information, etc. The trainer properties are defined when you add the trainer to the trainer list using the Add POIC Trainer dialog.

5.4 Help Menu

The Help menu is used to access on-line help for the Command Trainer application. Each of the items on the Help menu is described below.

Help Topics

Used to access the typical Windows Contents and Index on-line help window.

About Command Trainer

Used to view the About Command Trainer dialog.

5.5 Trainer List Pop-Up Menu

The Trainer List pop-up menu can be accessed by clicking the right mouse button in the trainer list area of the main window. If you right click in the trainer list area of the window, but you do not click on a trainer in the list, many of the menu items will be insensitive. This is because many of the menu items are only applicable when a trainer is selected. If you right click on a trainer in the trainer list all the menu items which are

applicable to that particular trainer at that moment in time will be sensitive. The Trainer List Pop-Up menu is identical to the Trainer menu on the menu bar.

5.6 Windows Edit Pop-Up Menu

The standard Windows Edit Pop-Up Menu can be accessed whenever your cursor is located inside an edit field inside the Command Trainer application. This menu contains the standard edit commands such as Cut, Copy, and Paste.

6 Command Trainer Dialog Boxes

This section describes all the dialog boxes in the Command Trainer application. For an example of how some of these dialogs are used while working with the Command Trainer application please see the Command Applications Tutorial (TREK-USER-021).

6.1 Set Color Preferences Dialog

The Set Color Preferences dialog is shown in Figure 2 below. It is used to control the color feature associated with the Command Trainer main window trainer list. The Command Trainer application simulates a POIC or Suitcase Simulator training session. Each session is added to the trainer list. The color of a trainer in the trainer list indicates the trainer's status. The color feature can be turned off. If it is off, the trainers in the trainer list will always be black. If the color feature is on, the trainers in the trainer list will turn a specific color based on the trainer status and the colors assigned in the Set Color Preferences dialog.

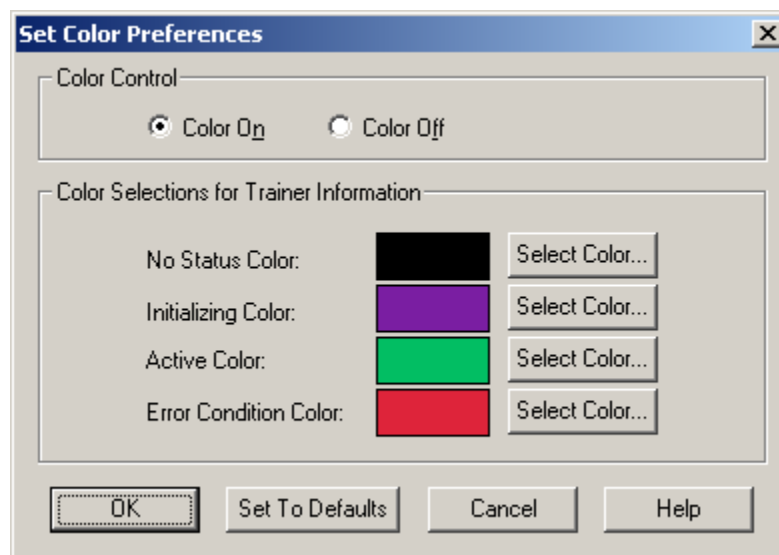


Figure 2 Set Color Preferences Dialog

Each field and control on the Set Color Preferences dialog is described below.

Color On

Turns the color feature on.

Color Off

Turns the color feature off.

No Status Color

The color assigned when the status of the trainer is “No Status”. “No Status” indicates that there is no information available about the trainer. This will be the case when the trainer has been added to the trainer list but it has not been activated. In this situation, your TReK system has not been told to do anything about the trainer and therefore has no status information about the trainer. (Default Color: Black)

Initializing Color

The color assigned when the status of the trainer is “Initializing”. This status will occur when the trainer is in the process of activating. (Default Color: Purple)

Active Color

The color assigned when the status of the trainer is “Active” or ready to support. This status will occur when the trainer has been activated. (Default Color: Green)

Error Condition Color

The color assigned when the trainer encounters an error. This status will occur when the trainer has been activated and an error occurs with the trainer. (Default Color: Red)

Buttons

Select Color

The Select Color button is used to access the standard Windows Color dialog in order to change the assigned color.

Set to Defaults

The Set to Defaults button will reset all the fields and controls in the Set Color Preferences dialog box to the original values that were in place when the TReK software was installed.

6.2 Add POIC Trainer Dialog

The Add POIC Trainer dialog is used to add a trainer to the trainer list in the main window. Remember that this is how to set up a command training session on your TReK system. Trainers are uniquely identified by the Trainer Name. As can be seen in Figure 3 the Add POIC Trainer dialog is divided into three sections: Trainer Information,

Connection Information, and Trainer Simulation Information. The Trainer Information section contains information that tells your TReK system how to identify the trainer. The Connection Information section tells your TReK system where to look for connections from Command Processing. The Trainer Simulation Information section allows you to select to use the default simulation file or choose a specific simulation file.

Figure 3 Add POIC Trainer Dialog

Each field on the Add POIC Trainer dialog is described below.

Name (Required Field)

The name field is used to tell your TReK system the name of your POIC Trainer.

Local IP Address (Required Field)

The Local IP address field is used to tell your TReK system the IP address that is being used to communicate with Command Processing. It's kind of like your home address on a letter that is arriving via your local postal service. The person who is sending the letter puts your address on it so the post office knows where to deliver the letter. The system that is commanding uses your IP address (and port number) to tell the networks along the way where to send the commands. In most cases you will probably enter your local TReK system's unicast IP Address. The IP Address field will automatically default to your local unicast IP address. If you want to see a list of all the IP addresses for your machine, just push the Browse button next to the IP address field. Your TReK system retrieves your local unicast IP address from the Windows registry. If you are not familiar with the registry, don't worry about it. You don't need to be familiar with the registry to use your TReK system.

If you are working with the TReK Command Processing application, you will define the POIC IP Address to be the IP Address here on the receiving side in the Command Trainer

application. If your machine does not have network connectivity (such as no ethernet card or modem or the system is not connected to a network), set the IP address to 127.0.0.1. This is called a loopback address and can be used while you are working in standalone mode.

Local Port (Required Field)

The Local Port is used to tell your TReK system which port to use for the Trainer. If you are working with the TReK Command Processing application, you will define the POIC Port Number to be the Port Number here on the receiving side in the Command Trainer application.

Trainer Simulation Information (Required Field)

The Trainer Simulation Information option is used to tell your TReK system whether the to use the default Trainer Simulation information or to use a specific trainer simulation file. If you choose to specify a simulation file, you must enter a filename in the text field. For more information on the simulation files see Appendix A.

6.3 Browse for IP Address Dialog

The Browse For IP Address dialog is shown in Figure 4. This dialog is used to search a TReK system for all IP addresses or network cards associated with the system.

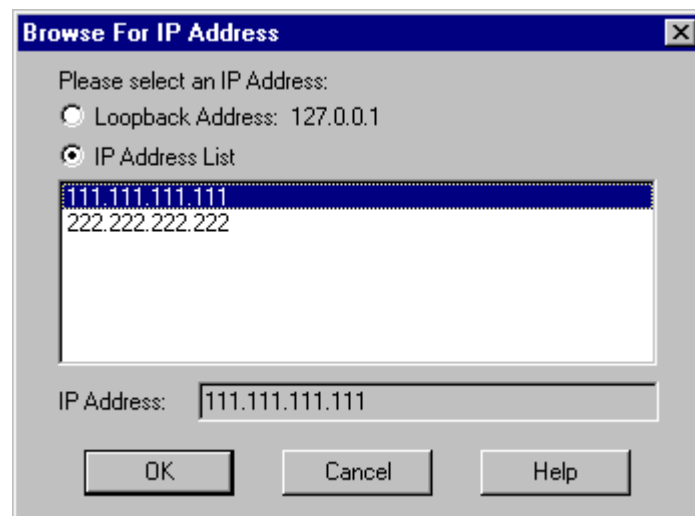


Figure 4 Browse For IP Address Dialog

Each field in the Browse For IP Address dialog is described below.

Please select an IP Address: (Required Field)

You have two options when choosing an IP address. If your TReK system does not have network connectivity (such as no ethernet card or modem or the system is not connected

to a network), you need to use the standard loopback address (127.0.0.1). This option is provided by choosing the “*Loopback Address: 127.0.0.1*” radio button. Users with one or more network cards will need to choose which network card or IP Address they would like to use. Choosing the “*IP Address List*” radio button provides this option. The user must then select an IP address from the list.

IP Address

The IP Address field is filled in when you select the Loopback IP address or an IP Address in the list. The IP Address will be copied to the dialog box that contained the button you used to bring up the Browse For IP Address dialog.

6.4 Trainer Properties Dialog

The Trainer Properties dialog is used to see a complete list of properties of the trainer configuration supporting your command session. This includes information such as the Trainer Information, Connection Information, and Trainer Simulation Information. The trainer properties are defined when you add the trainer to the trainer list using the Add POIC Trainer dialog. The Show Trainer Properties dialog has two different dialog boxes depending on what type of trainer the trainer is or if the trainer has been activated. If the trainer is not active, the Show Properties Dialog is identical to the Add POIC Trainer dialog. This can be seen in Figure 5. Since the Trainer is not active, the fields in the dialog can be modified.

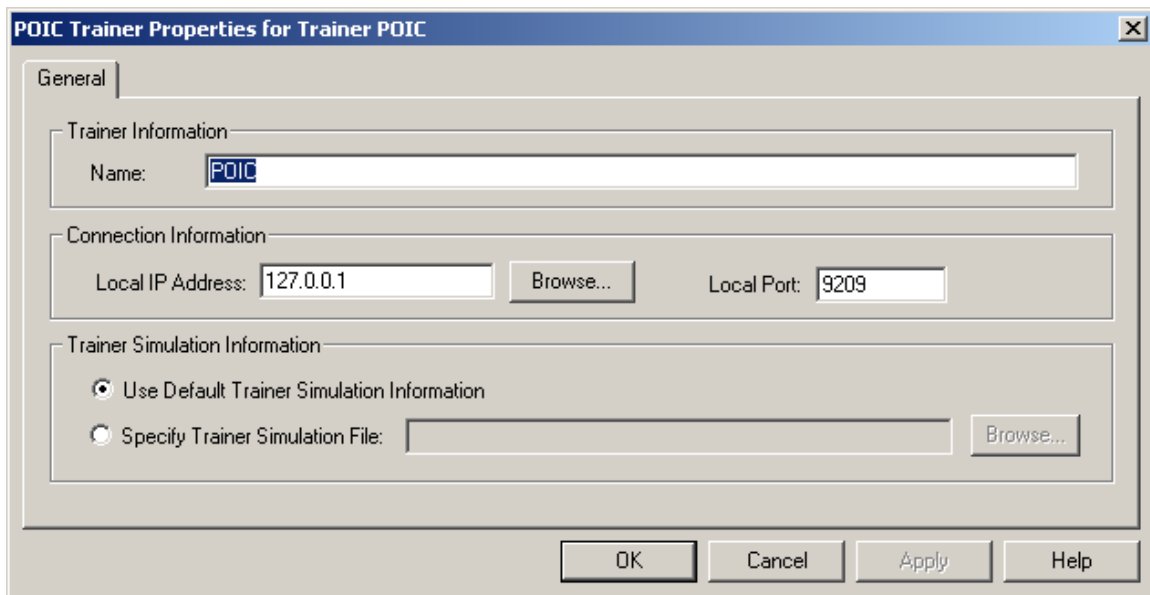


Figure 5 POIC Trainer Properties for POIC Trainer Dialog (Inactive)

Once a trainer has been activated, the Trainer Properties are different.

The Trainer Properties for POIC Trainer is a tabbed dialog with five tabs: General, Configuration, Status, Commands, and Responses. The General Tab shown in Figure 6 is

identical to the Add POIC Trainer dialog except information on this dialog cannot be changed after the Trainer has been activated.

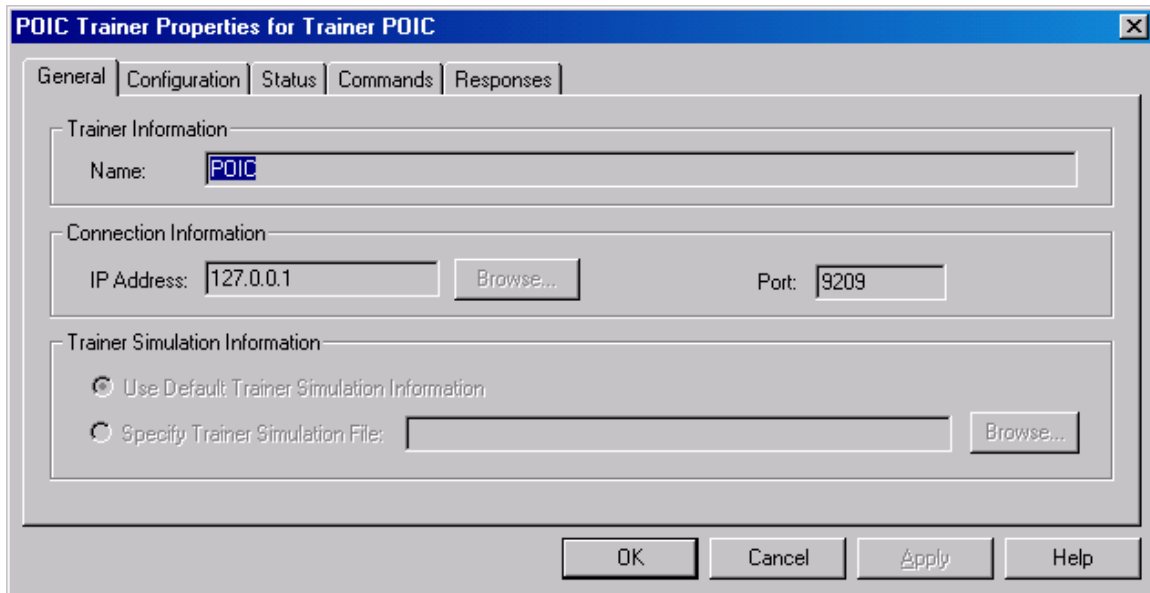


Figure 6 POIC Trainer Properties for Trainer POIC (General Tab) Dialog

The Configuration Tab is shown in Figure 7. It contains POIC configuration information that is used to determine if commands are clear to send, what responses are enabled, time intervals and timeouts, and maximum retries. You can make changes to this information and push OK or Apply to have the information transmitted to any connected application (Command Processing).

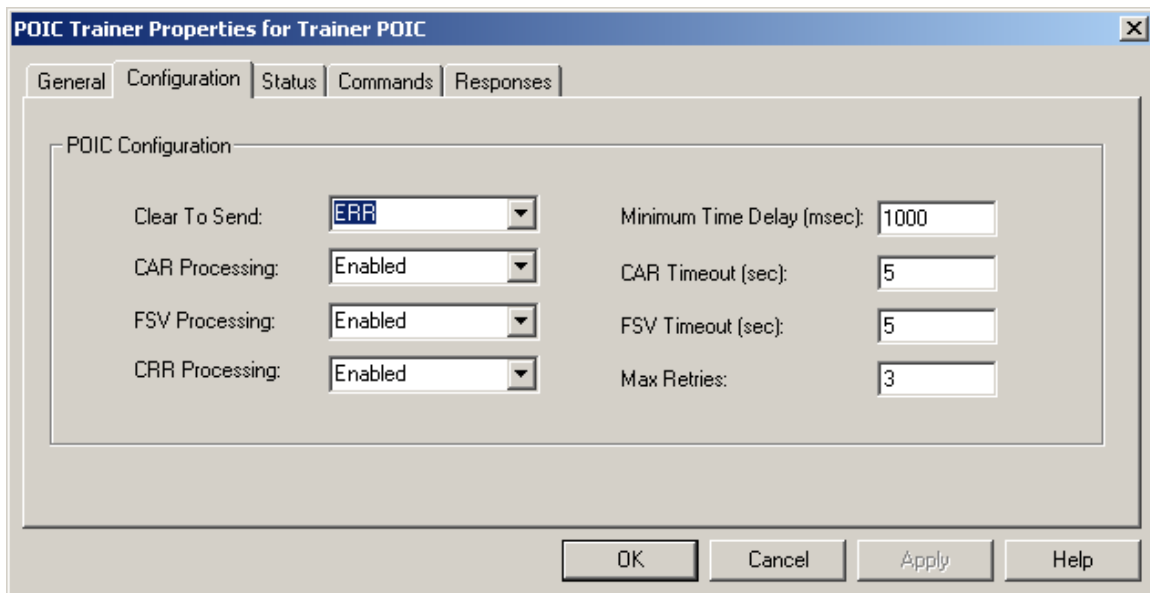


Figure 7 POIC Trainer Properties for Trainer POIC (Configuration Tab) Dialog

The Status Tab shown in Figure 8 provides the status of the POIC Trainer. You can make changes to this information and push OK or Apply to have the information transmitted to any connected application (Command Processing).

The dialog box titled "POIC Trainer Properties for Trainer POIC" has five tabs: General, Configuration, Status, Commands, and Responses. The Status tab is active, showing the "POIC Status" section with the following settings:

User:	Enabled	MCC-H Connection:	Connected
User Inhibited Status:	Not Inhibited	MCC-H Enablement:	Enabled
Remote Commanding:	Enabled	S-Band ADS/LOS:	ADS
Remote EHS:	Disabled	Ku-Band ADS/LOS:	LOS
POIC Connection:	Connected	Uplink Path:	S-Band High Rate (CCS)
POIC Enablement:	Enabled	Current Station Mode:	Microgravity

At the bottom are buttons for OK, Cancel, Apply, and Help.

Figure 8 POIC Trainer Properties for Trainer POIC (Status Tab) Dialog

The Commands Tab shown in Figure 9, provides a list of commands that are allowed and what type of responses that should be returned.

The dialog box titled "POIC Trainer Properties for Trainer POIC" has five tabs: General, Configuration, Status, Commands, and Responses. The Commands tab is active, showing a table of commands and their properties.

Command	Status	Type	ERR	CAR1	CAR2	FSV1	FSV2	CRR	UPD
ACCELERATE	Enabled	Modifiable	Default	Default	Default	Default	Default	Default	Default
CAMERA_MODE	Enabled	Modifiable	Default	Default	Default	Default	Default	Default	Default
DIRECTORY_REQ...	Enabled	Modifiable	Default	Default	Default	Default	Default	Default	Default
LOAD_PARAMETER	Enabled	Modifiable	Default	CAR1...	None	None	None	None	Default
MAX_TEMP	Enabled	Modifiable	Default	Default	Default	Default	Default	Default	Default
POWER_OFF	Disabled	Predefined	Default	Default	Default	Default	Default	Default	None
TEST_SWITCH	Enabled	Modifiable	Default	Default	Default	Default	Default	None	Default

A "Modify..." button is located at the bottom right of the table area. At the bottom of the dialog are buttons for OK, Cancel, Apply, and Help.

Figure 9 POIC Trainer Properties for Trainer POIC (Commands Tab) Dialog

The Response Tab shown in Figure 10 provides a list of default responses for each command acknowledgement. You can add new responses and assign them to commands

on the Commands tab. These responses will be sent back to applications making requests to this POIC Trainer.

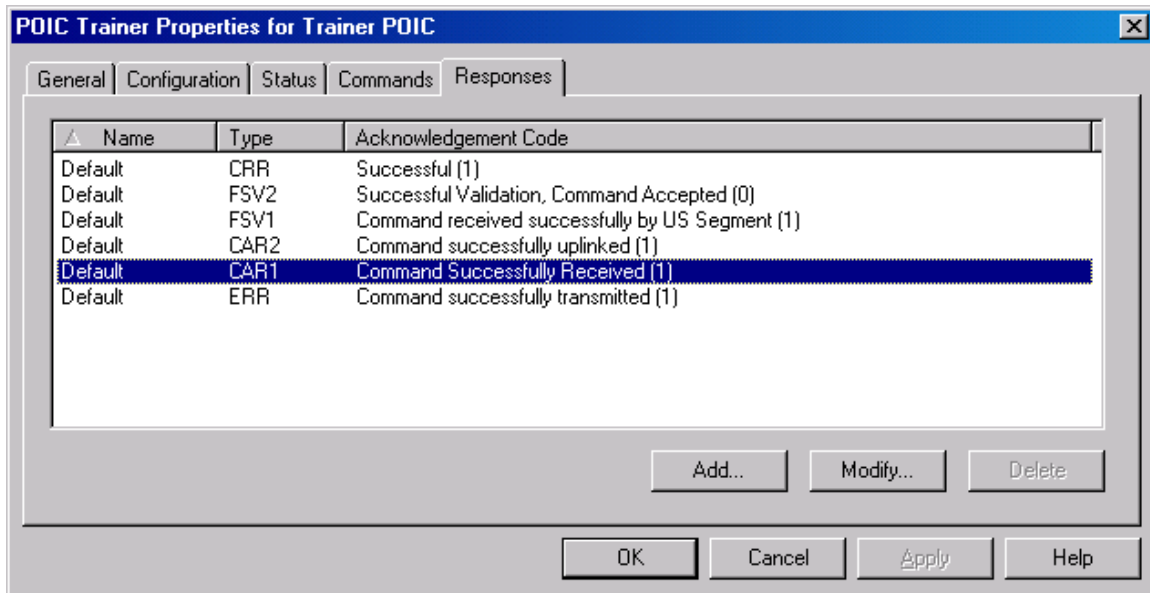


Figure 10 POIC Trainer Properties for POIC Trainer (Responses Tab) Dialog

6.5 Modify Command Dialog

The Modify Command dialog shown in Figure 11 is displayed to modify a command's status or responses.

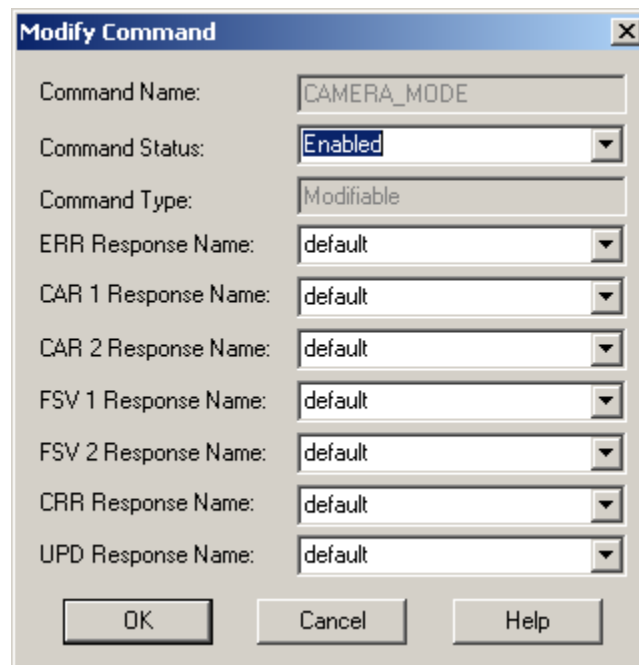


Figure 11 Modify Command Dialog

6.6 Add Response Dialog

The Add Response dialog shown in Figure 12 is displayed to add a command response to the POIC Trainer.

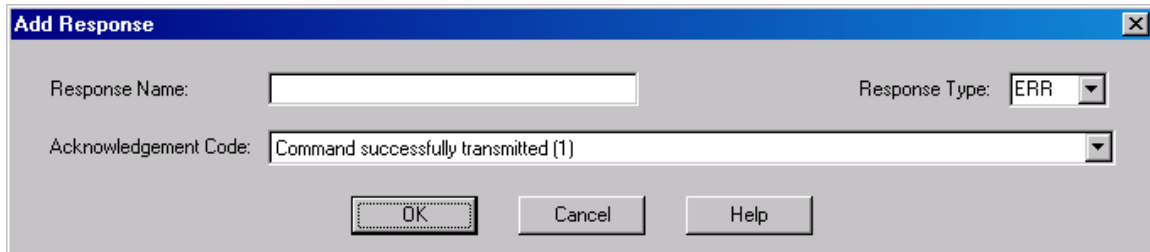


Figure 12 Add Response Dialog

6.7 Modify Response Dialog

The Modify Response dialog shown in Figure 13 is displayed to modify a command response's acknowledgement.

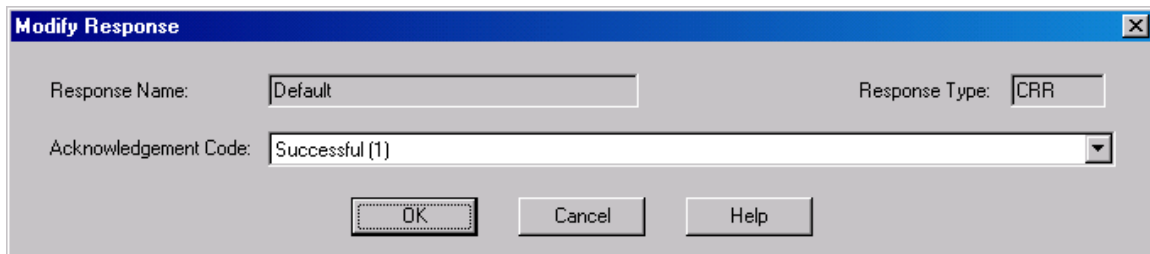


Figure 13 Modify Response Dialog

6.8 Delete Trainer Warning Message Dialog

The Delete Trainer Warning message dialog will appear if you attempt to delete a trainer from the trainer list in the main window. If you are sure you want to proceed answer Yes. If you do not want to proceed answer No and no action will be taken.

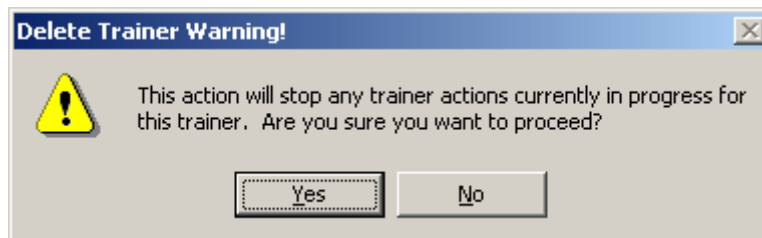


Figure 14 Delete Trainer Warning Message Dialog

6.9 Invalid Configuration Information Dialog

The Invalid Configuration Information dialog is shown in Figure 15. This dialog appears only if you attempt to open a configuration file that contains invalid configuration information. This usually happens when you move a configuration file from one machine to another. For example, when you save a configuration file, the trainers and all the information associated with the trainers (including the IP address information) are stored in the configuration file. If you move the configuration file, then some of this information will no longer be valid.

The Invalid Configuration Information dialog contains two lists. The list at the top of the dialog contains a list of the destinations that are stored in the configuration file. If the trainer contains any invalid information it will be red. When you select a trainer in the trainer list, the list located below the trainer list will display all the invalid items associated with that particular trainer.

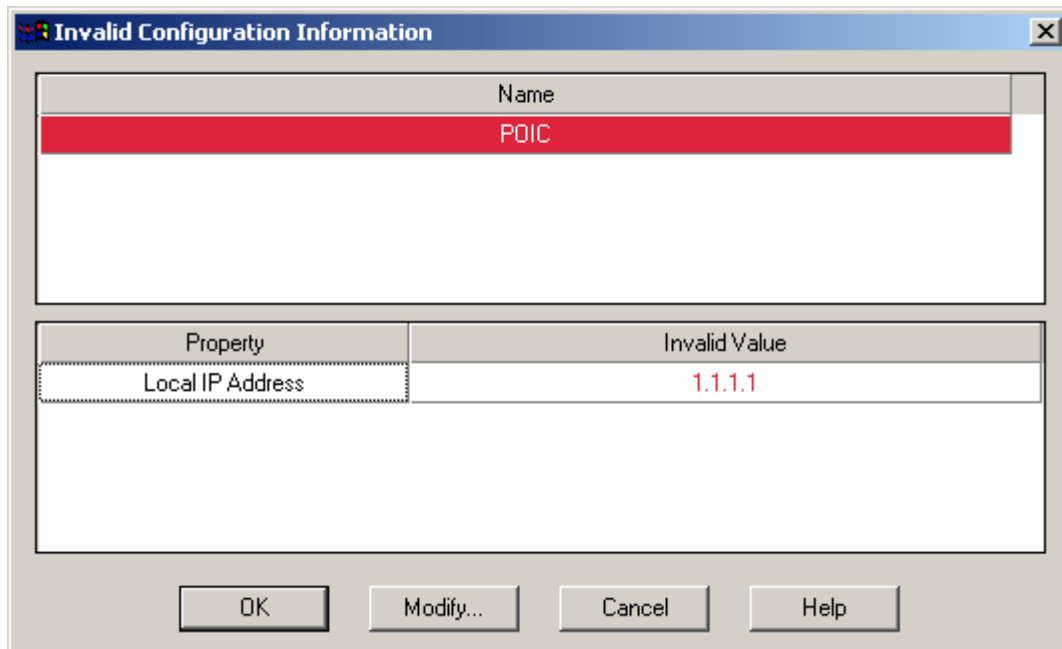


Figure 15 Invalid Configuration Information Dialog

Buttons

Modify

When you select a trainer in the trainer list and push the Modify button, the Trainer Properties dialog will be displayed. The Trainer Properties dialog can be used to change the properties that are invalid.

Cancel

Selecting the Cancel button will abort the entire process and leave the configuration file unchanged.

6.10 Close Configuration Warning Message Dialog

The Close Configuration Warning message dialog will appear if you attempt to perform a New or Open and there are trainers in the trainer list. If you are sure you want to proceed answer Yes. If you do not want to proceed answer No and no action will be taken.

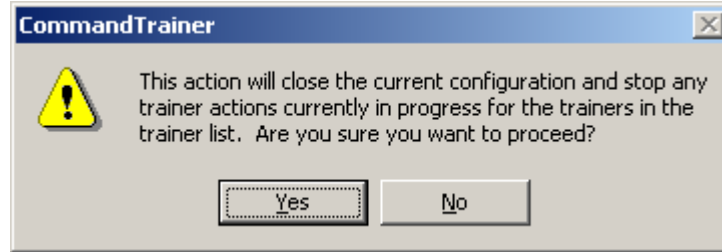


Figure 16 Close Configuration Warning Message Dialog

6.11 Save Changes Message Dialog

The Save Changes message dialog will be displayed when you close the current configuration by selecting New, Open, or Exit. The Save Changes message dialog provides a way to save the current configuration before closing it.

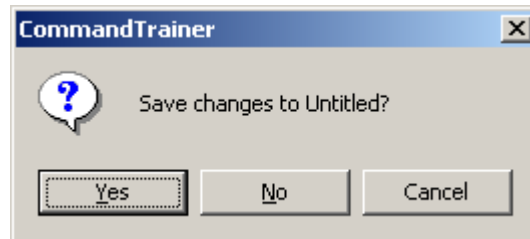


Figure 17 Save Changes Message Dialog

6.12 Exit Confirmation Message Dialog

The Exit Confirmation message dialog is displayed to help you avoid exiting the Command Trainer application by accident. It will be displayed only if you exit the application with the current configuration unchanged. If the configuration has changed, you will be prompted with the Save Changes dialog instead of the Exit Confirmation dialog. If you are prompted with the Exit Confirmation dialog and you are sure you want to exit, answer Yes. If you do not want to exit the application, answer No and the application will not proceed with the exit.

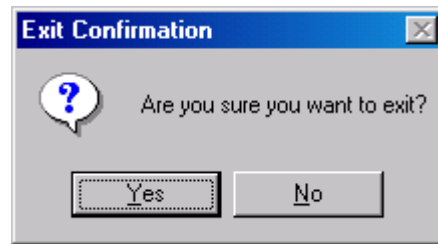


Figure 18 Exit Confirmation Message Dialog

7 Special Topics

There are no special topics at this time.

Appendix A Command Trainer File

You can modify how the Command Trainer simulates the POIC by creating a text file that describes the behavior you want. When you add a POIC trainer to the Command Trainer application, you have the option of using the default simulation file or you can choose one you have created. The easiest way to create one is to copy the default file and edit it. This allows you to set up the initial configuration of the Command Trainer and also is the only way for you to use your commands with the Command Trainer. The default configuration file is found in the user directories. On most systems you will find the file in the following directory:

C:\Documents and Settings\<username>\Application Data\TReK\simulation_files\commanding

Note: If you do not see the Application Data folder, it is because your computer is not set up to show hidden folders. To show hidden folders, go to a Windows Explorer window and choose Folder Options from the Tools menu. Click on the View tab and choose the "Show hidden files and folders" radio button.

The name for the default simulation file is poic_sim_default.txt. You should always use the .txt extension. Once you copy the file, you can edit it to add your commands and change the behavior of the Command Trainer.

The following paragraphs describe what information can be placed in a command trainer file for use in the Command Trainer application. This file describes how the user would like the POIC to behave for the command session. This includes connection, configuration/status information, and command responses. There is a default message for each response type. The names used are not case sensitive. The comment delimiter is a double forward slash (//) and any text after the comment delimiter is ignored. No spaces are allowed in any names.

For more information about each of the messages, see the Payload to Generic User Interface Definition Document (PGUIDD) Volume 2 (SSP-50305).

Message Directive

The *message* directive is used to identify a command message that should be sent by the Command Trainer. The format for the directive is shown below. NOTE: The name "None" is reserved.

```
#message <TYPE> <NAME>
<FieldName> <FieldValue>
#end_message
```

Valid TYPE values are

CONNECTION_ACKNOWLEDGMENT
 COMMAND_SYSTEM_CONFIGURATION
 COMMAND_SYSTEM_STATUS
 ERR
 CAR1
 CAR2
 FSV1
 FSV2
 CRR
 UPD

NOTE: There is only one of the following types of messages allowed. The last one read will be used. It really doesn't matter what you name it.

CONNECTION_ACKNOWLEDGMENT
 COMMAND_SYSTEM_CONFIGURATION
 COMMAND_SYSTEM_STATUS

Valid field names for each type are shown below with the data type for field name and the default value. If a field name is not specified the default value is used for the field.

CONNECTION_ACKNOWLEDGMENT

Field	Data Type	Default Value
SourceMessageKey	unsigned integer	245
Status	unsigned integer	1
Project	string	ISS
Mission	string	UF-3
OperationalSupportMode	string	Test
CommandDBVersion	string	0001

COMMAND_SYSTEM_CONFIGURATION

Field	Data Type	Default Value
ClearToSend	unsigned integer	0
CARProcessingEnablement	unsigned integer	1
FSVProcessingEnablement	unsigned integer	1
CRRProcessingEnablement	unsigned integer	1
MinimumTimeDelay	unsigned integer	1000
CARTimeout	unsigned integer	5
FSVTimeout	unsigned integer	5
MaximumRetries	unsigned integer	3

COMMAND_SYSTEM_STATUS

Field	Data Type	Default Value
UserEnablement	unsigned integer	1
NonEHSCommandingEnablement	unsigned integer	1
Unused	unsigned integer	0
RemoteEHSEnablement	unsigned integer	0
POICConnection	unsigned integer	1
POICEnablement	unsigned integer	1
MCCHConnection	unsigned integer	1
MCCHEnablement	unsigned integer	1
UplinkPath	unsigned integer	2
AOS	unsigned integer	1
CurrentStationMode	unsigned integer	2

NOTE: The User Inhibited Status and Ku-Band AOS/LOS status fields cannot be set in the command trainer file.

For the command responses, most fields are generated automatically based on the input and the current state of the simulation. For example, if the user is disabled, the ERR will, by default, return 35 (user disabled from commanding). Some error codes can only be simulated by actually overriding the default value for the messages. The acknowledgment code is broken into three pieces so that the two FSV responses can be correctly filled through this file. All command responses have the same fields.

ERR

CAR1

CAR2

FSV1

FSV2

CRR

Field	Data Type	Default Value
ReflectedPktSeqCount	unsigned integer	default is to use correct value
CoarseTime	unsigned integer	default is to use correct value
FineTime	unsigned integer	default is to use correct value
Unused	unsigned integer	0
AckCodeFirstWord	unsigned integer	0
AckCodeSecondWord	unsigned integer	0
AckCodeLastTwoWords	unsigned integer	default is to use correct value or success

The response for command updates is controlled by the UPD response. It contains two values listed below.

UPD

Field	Data Type	Default Value
AckCode	unsigned integer	default is to use correct value or success

Unused unsigned integer 0

Commands Directive

The *commands* directive lists the command names (mnemonics) that are to be part of the command session. The format for the directive is shown below.

```
#commands
<CommandName> <E/D> <ERR> <CAR1> <CAR2> <FSV1> <FSV2> <CRR> <UPD>
#end_commands
```

You can have as many commands as you would like in the commands directive. Each command and its fields should be on a separate line. A description of each field follows.

Field	Description
<E/D>	Command is either enabled (E) or disabled (D)
<ERR>	Response name for ERR Command Response, if not found will use default
<CAR1>	Response name for CAR1 Command Response, if not found will use default
<CAR2>	Response name for CAR2 Command Response, if not found will use default
<FSV1>	Response name for FSV1 Command Response, if not found will use default
<FSV2>	Response name for FSV2 Command Response, if not found will use default
<CRR>	Response name for CRR Command Response, if not found will use default
<UPD>	Response name for Command Update Response, if not found will use default

NOTE: By using the reserved name "None" for a command response, the simulator will never send that response.

Command Fields Directive

The *command_fields* directive lists the modifiable fields for a command in order to provide some level of POIC simulation. The Command Trainer will only verify that command update requests contain all of the modifiable fields as described with this directive. The format for the directive is shown below.

```
#command_fields <CommandName>
<CommandFieldName>
#end_command_fields
```

The *CommandName* should match a command name that exists in the *commands* directive. If a command has multiple modifiable fields, each should be listed on a separate line.

Critical Command List Directive

The *critical_command_list* directive lists all of the commands that are to be considered critical by the Command Trainer. You will only need to use this directive if you have

commands that are considered critical in the POIC database. The format of the directive is shown below.

```
#critical_command_list  
<CommandName>  
#end_critical_command_list
```

Each *CommandName* should match a command name that exists in the *commands* directive. If you have multiple critical commands, each should be listed on a separate line.

Appendix B Glossary

Note: This Glossary is global to all TReK documentation. All entries listed may not be referenced within this document.

Application Programming Interface (API)	A set of functions used by an application program to provide access to a system's capabilities.
Application Process Identifier (APID)	An 11-bit field in the CCSDS primary packet header that identifies the source-destination pair for ISS packets. The type bit in the primary header tells you whether the APID is a payload or system source-destination.
Calibration	The transformation of a parameter to a desired physical unit or text state code.
Communications Outage Recorder	System that captures and stores payload science, health and status, and ancillary data during TDRSS zone of exclusion.
Consultative Committee for Space Data Systems (CCSDS) format	Data formatted in accordance with recommendations or standards of the CCSDS.
Consultative Committee for Space Data Systems (CCSDS) packet	A source packet comprised of a 6-octet CCSDS defined primary header followed by an optional secondary header and source data, which together may not exceed 65535 octets.
Conversion	Transformation of downlinked spacecraft data types to ground system platform data types.
Custom Data Packet	A packet containing a subset of parameters that can be selected by the user at the time of request.
Cyclic Display Update Mode	A continuous update of parameters for a particular display.
Decommuration (Decom)	Extraction of a parameter from telemetry.
Discrete Values	Telemetry values that have states (e.g., on or off).

Dump	During periods when communications with the spacecraft are unavailable, data is recorded onboard and played back during the next period when communications resume. This data, as it is being recorded onboard, is encoded with an onboard embedded time and is referred to as dump data.
Enhanced HOSC System (EHS)	Upgraded support capabilities of the HOSC systems to provide multi-functional support for multiple projects. It incorporates all systems required to perform data acquisition and distribution, telemetry processing, command services, database services, mission support services, and system monitor and control services.
Exception Monitoring	A background process capable of continuously monitoring selected parameters for Limit or Expected State violations. Violation notification is provided through a text message.
Expected State Sensing	Process of detecting a text state code generator in an off-nominal state.
EXPRESS	An EXPRESS Rack is a standardized payload rack system that transports, stores and supports experiments aboard the International Space Station. EXPRESS stands for EXpedite the PProcessing of Experiments to the Space Station.
File transfer protocol (ftp)	Protocol to deliver file-structured information from one host to another.
Flight ancillary data	A set of selected core system data and payload health and status data collected by the USOS Payload MDM, used by experimenters to interpret payload experiment results.

Grayed out	Refers to a menu item that has been made insensitive, which is visually shown by making the menu text gray rather than black. Items that are grayed out are not currently available.
Greenwich Mean Time (GMT)	The solar time for the meridian passing through Greenwich, England. It is used as a basis for calculating time throughout most of the world.
Ground ancillary data	A set of selected core system data and payload health and status data collected by the POIC, which is used by experimenters to interpret payload experiment results. Ground Ancillary Data can also contain computed parameters (pseudos).
Ground receipt time	Time of packet origination. The time from the IRIG-B time signal received.
Ground Support Equipment (GSE)	GSE refers to equipment that is brought in by the user (i.e. equipment that is not provided by the POIC).
Ground Support Equipment Packet	A CCSDS Packet that contains data extracted from any of the data processed by the Supporting Facility and the format of the packet is defined in the Supporting Facility's telemetry database.
Huntsville Operations Support Center (HOSC)	A facility located at the Marshall Space Flight Center (MSFC) that provides scientists and engineers the tools necessary for monitoring, commanding, and controlling various elements of space vehicle, payload, and science experiments. Support consists of real-time operations planning and analysis, inter- and intra-center ground operations coordination, facility and data system resource planning and scheduling, data systems monitor and control operations, and data flow coordination.

IMAQ ASCII	A packet type that was added to TReK to support a very specific application related to NASA's Return to Flight activities. It is not applicable to ISS. It is used to interface with an infrared camera that communicates via ASCII data.
Limit Sensing	Process of detecting caution and warning conditions for a parameter with a numerical value.
Line Outage Recorder Playback	A capability provided by White Sands Complex (WSC) to play back tapes generated at WSC during ground system communication outages.
Measurement Stimulus Identifier (MSID)	Equivalent to a parameter.
Monitoring	A parameter value is checked for sensing violations. A message is generated if the value is out of limits or out of an expected state.
Parameter	TReK uses the generic term parameter to mean any piece of data within a packet. Sometimes called a measurement or MSID in POIC terminology.
Payload Data Library (PDL)	An application that provides the interface for the user to specify which capabilities and requirements are needed to command and control his payload.
Payload Data Services Systems (PDSS)	The data distribution system for ISS. Able to route data based upon user to any of a number of destinations.
Payload Health and Status Data	Information originating at a payload that reveals the payload's operational condition, resource usage, and its safety/anomaly conditions that could result in damage to the payload, its environment or the crew.
Payload Operations Integration Center (POIC)	Manages the execution of on-orbit ISS payloads and payload support systems in coordination/unison with distributed International Partner Payload Control Centers, Telescience Support Centers (TSC's) and payload-unique remote facilities.

Payload Rack Checkout Unit (PRCU)	The Payload Rack Checkout Unit is used to verify payload to International Space Station interfaces for U.S. Payloads.
Playback	Data retrieved from some recording medium and transmitted to one or more users.
Pseudo Telemetry (pseudo data)	Values that are created from calculations instead of directly transported telemetry data. This pseudo data can be created from computations or scripts and can be displayed on the local PC.
Remotely Generated Command	A command sent by a remote user whose content is in a raw bit pattern format. The commands differ from predefined or modifiable commands in that the content is not stored in the POIC Project Command Database (PCDB).
Science data	Sensor or computational data generated by payloads for the purpose of conducting scientific experiments.
Subset	A collection of parameters from the total parameter set that is bounded as an integer number of octets but does not constitute the packet itself. A mini-packet.
Super sampled	A parameter is super sampled if it occurs more than once in a packet.
Swap Type	A flag in the Parameter Table of the TReK database that indicates if the specified datatype is byte swapped (B), word swapped (W), byte and word swapped (X), byte reversal (R), word reversal (V) or has no swapping (N).
Switching	A parameter's value can be used to switch between different calibration and sensing sets. There are two types of switching on TReK: range and state code.

Transmission Control Protocol (TCP)	TCP is a connection-oriented protocol that guarantees delivery of data.
Transmission Control Protocol (TCP) Client	A TCP Client initiates the TCP connection to connect to the other party.
Transmission Control Protocol (TCP) Server	A TCP Server waits for (and accepts connections from) the other party.
Telemetry	Transmission of data collected from a source in space to a ground support facility. Telemetry is downlink only.
Telescience Support Center (TSC)	A TSC is a NASA funded facility that provides the capability to plan and operate on-orbit facility class payloads and experiments, other payloads and experiments, and instruments.
User Application	Any end-user developed software program that uses the TREK Application Programming Interface software. Used synonymously with User Product.
User Data Summary Message (UDSM)	Packet type sent by PDSS that contains information on the number of packets sent during a given time frame for a PDSS Payload packet. For details on UDSM packets, see the POIC to Generic User IDD (SSP-50305).
Uplink format	The bit pattern of the command or file uplinked.
User Datagram Protocol (UDP)	UDP is a connection-less oriented protocol that does not guarantee delivery of data. In the TCP/IP protocol suite, the UDP provides the primary mechanism that application programs use to send datagrams to other application programs. In addition to the data sent, each UDP message contains both a destination port number and a fully qualified source and destination addresses making it possible for the UDP software on the destination to deliver the message to the correct recipient process and for the recipient process to send a reply.

User Product	Any end-user developed software program that uses the TReK Application Programming Interface software. Used synonymously with User Application.
Web	Term used to indicate access via HTTP protocol; also referred to as the World Wide Web (WWW).

Appendix C Acronyms

Note: This acronym list is global to all TReK documentation. Some acronyms listed may not be referenced within this document.

AOS	Acquisition of Signal
API	Application Programming Interface
APID	Application Process Identifier
ASCII	American Standard Code for Information Interchange
CAR	Command Acceptance Response
CAR1	First Command Acceptance Response
CAR2	Second Command Acceptance Response
CCSDS	Consultative Committee for Space Data Systems
CDB	Command Database
CDP	Custom Data Packet
COR	Communication Outage Recorder
COTS	Commercial-off-the-shelf
CRR	Command Reaction Response
DSM	Data Storage Manager
EHS	Enhanced Huntsville Operations Support Center (HOSC)
ERIS	EHS Remote Interface System
ERR	EHS Receipt Response
EXPRESS	Expediting the Process of Experiments to the Space Station
ES	Expected State
FAQ	Frequently Asked Question
FDP	Functionally Distributed Processor
FSV	Flight System Verifier
FSV1	First Flight System Verifier
FSV2	Second Flight System Verifier
FPD	Flight Projects Directorate
FTP	File Transfer Protocol
GMT	Greenwich Mean Time
GRT	Ground Receipt Time
GSE	Ground Support Equipment
HOSC	Huntsville Operations Support Center
ICD	Interface Control Document
IMAQ ASCII	Image Acquisition ASCII
IP	Internet Protocol
ISS	International Space Station
LDP	Logical Data Path
LES	Limit/Expected State
LOR	Line Outage Recorder
LOS	Loss of Signal
MCC-H	Mission Control Center – Houston
MOP	Mission, Operational Support Mode, and Project
MSFC	Marshall Space Flight Center
MSID	Measurement Stimulus Identifier

NASA	National Aeronautics and Space Administration
OCDB	Operational Command Database
OS	Operating System
PC	Personal Computer, also Polynomial Coefficient
PCDB	POIC Project Command Database
PDL	Payload Data Library
PDSS	Payload Data Services System
PGUIDD	POIC to Generic User Interface Definition Document
POIC	Payload Operations Integration Center
PP	Point Pair
PRCU	Payload Rack Checkout Unit
PSIV	Payload Software Integration and Verification
RPSM	Retrieval Processing Summary Message
SC	State Code
SCS	Suitcase Simulator
SSP	Space Station Program
SSCC	Space Station Control Center
SSPF	Space Station Processing Facility
TCP	Transmission Control Protocol
TReK	Telescience Resource Kit
TRR	TReK Receipt Response
TSC	Telescience Support Center
UDP	User Datagram Protocol
UDSM	User Data Summary Message
URL	Uniform Resource Locator
USOS	United States On-Orbit Segment
VCDU	Virtual Channel Data Unit
VCR	Video Cassette Recorder
VPN	Virtual Private Network